



Name :

Roll No. :

Invigilator's Signature :

CS/M.Tech (CHE)/SEM-2/CH-11-IV (I)/2010

2010

PETROCHEMICAL TECHNOLOGY

Time Allotted : 3 Hours

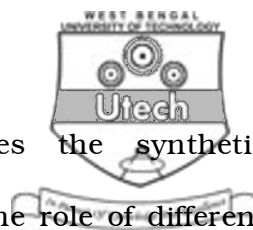
Full Marks : 70

The figures in the margin indicate full marks.

Candidates are required to give their answers in their own words as far as practicable.

Answer any five questions. $5 \times 14 = 70$

1. a) Explain the problem of using strong basic solution for sweetening of natural gas & how it can be overcome ? Briefly discuss about the Merox Process on natural gas sweetening. $2 + 6$
- b) What kind of naphthenes & aromatic compounds are present in crude oil and how are they recovered industrially ? Discuss about the technological aspect of sulfur compound removal from crude oil. $4 + 2$
2. a) Give an operational overview of steam reforming process of naphtha for synthesis gas production highlighting two important unit processes of 'shift conversion' & 'methanation'. 6
- b) Critically discuss about the temperature sensitivity and catalyst selectivity of 'oxosynthesis' operation. How is propionaldehyde manufactured industrially ? $3 + 5$



3. a) What chemical modification makes the synthetic detergent biodegradable ? Mention the role of different ingredients other than surfactant taken in finishing process of synthetic detergent. 2 + 4
- b) What are the process intensification technologies being introduced rapidly in modern petrochemical industries ? How these technologies have been analysed and implemented ? Give an overview of Micro-channel Reactors. 2 + 2 + 4
4. a) Explain the merits and demerits of Orthoflow catalytic cracking unit and stacked catalytic cracking unit.
- b) Explain the concept of 'Chemical Refinery'. 10 + 4
5. Draw the net process flow-sheet of Naphtha cracking unit and discuss about the parameters which influence the process drastically. 14
6. a) What does it mean by 'Breathing losses' ? Explain the concept of crank case dilution.
- b) How many techniques you may suggest to minimize the catalysts deactivation ? 8 + 6



7. Write short notes on any *four* of the following :

$4 \times 3 \frac{1}{2}$

- a) Fisher Tropsch Synthesis
- b) Natural Gas Liquids
- c) Reactive distillation
- d) Catalyst Morphology and Activity
- e) Diesel Additives
- f) ASTM Distillation Characteristics.
